

ZOOLOGY.—*Antrogonodesmus*, a new chelodesmoid genus from Cuba, and a re-description of *Amphelictogon dolius* Chamberlin (*Polydesmida*, *Chelodesmidae*).
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(Received June 16, 1959)

So far less than 80 species of Diplopoda have been recorded from Cuba, a small number which reflects inadequate collecting rather than an impoverished fauna. More than half of the known species have been taken in the mountains of Oriente Province, and it seems reasonable to presume that attention to other parts of the island will greatly augment our knowledge of the millipeds of Cuba. The first large contribution to this general subject was made in 1918, when R. V. Chamberlin described a considerable number of Cuban species (unfortunately without illustrations), the majority of which are still known only from the original types. In recent years H. F. Loomis has added a large number of new species to the list, and redescribed some of the older ones.

Two separate collections of Cuban diplopods, received by the U. S. National Museum and kindly transmitted to me for study by Dr. Ralph E. Crabill, are of exceptional interest. One includes a remarkable new genus of the Chelodesmidae without close relatives elsewhere in the family; the other contains male specimens of *Amphelictogon dolius*, a species originally based on females and not subsequently rediscovered.

FAMILY CHELODESMIDAE Cook

The status of this name has been the subject of much dissention ever since its proposal in 1895, but with the recent discovery that the type genus is subjectively synonymous with the older name *Eurydesmus*, plus the latest (Copenhagen, 1953) decisions concerning the formation of family names, there can hardly be any doubt that it is the correct name for the group of genera which has long been called the family Leptodesmidae by most European workers. A detailed study of classification within the limits of this huge group and its satellite families is in preparation at this time, and should settle the question of how much ground should be covered by the name Chelodesmidae in a stricter sense than now employed.

On the basis of work completed to date, it can safely be said that of the two genera here discussed, at least *Amphelictogon* is very closely related to both *Eurydesmus* and *Leptodesmus*, falling in the same family with the former and in the same subfamily or tribe with the latter genus. This association is made on the basis of comparison with material of species strictly congeneric with the type species of the three genera named, including newly-found characters of antennal structure, form of the 2nd leg pair, body shape and proportion, paranotal configuration, and formation of the male genitalia. Less can be said concerning the status of *Antrogonodesmus* although it is obviously a member of the Chelodesmidae in a restricted sense.

Antrogonodesmus, n. gen.

Type species.—*Antrogonodesmus curiosus*, n. sp.

Diagnosis.—A remarkable chelodesmid genus differing from all other known genera by the form of the gonopods. The coxae are normal for the family in shape, mode of connection, and presence of a long coxal process, but the prefemora are greatly enlarged and impressed on the ventral side into a deep cavity densely beset with long macrosetae. The prefemoral process is short and distally biramous, one of the divisions forming a shield for the solenomerite. The latter is short and laminate, slender, unmodified, largely concealed by the prefemoral process and by a femoral process which is somewhat expanded and functioning as a solenophor.

Body form chelodesmid, e.g., with the anterior four of five segments broadest and the following paranota becoming gradually reduced in size in going caudad and well separated from each other by the large prozonites which are only partly included by the preceding metazonites. A distinct interzonal furrow in the segmental constriction. Pore formula normal, the pores opening near the end of slender elongate peritremata. Tergites, pleurites, and sternites all smooth and glabrous, without any surficial modifications. Legs long and slender, virtually glabrous, those of the male sex with distinct

tibial pads extending back as far as the eighth segment.

***Antrogonodesmus curiosus*, n. sp.**

FIGS. 1-4

Type specimens.—Male holotype and female paratype, U. S. Nat. Mus. (Myriapod Type no. 2581), from San Vicente, Pinar del Río Province, Cuba, collected in June 1956, by N. L. H. Krauss.

Diagnosis.—With the characters of the genus. Specific characters probably are reflected in the size, color pattern, and gonopod configuration.

Description.—Male holotype: an elongate, slender, caudally attenuate chelodesmoid, the paranota of segments 2-4 rather broad, transverse, almost horizontal, subrectangular, those following gradually decreasing in size. Length, approximately 34 mm., widths of selected segments as follows:

Collum	5.1mm
2d	5.2
3d	5.1
4th	5.0
6th	4.6
10th	4.5
16th	4.1
18th	3.2

Body chiefly tan to a light testaceous-brown, the intersegmental constriction more darkly pigmented across dorsum. Caudolateral corners of paranota, the entire collum, and large mid-dorsal spots on the 2d and 3d segments chalky white. Antennae, legs, and underparts light tan to nearly colorless.

Head convex, smooth, polished, the vertical groove very distinct and extending down to middle of interantennal isthmus. latter broad, twice length of first antennal article. Frons and clypeus with numerous scattered setae, these extending laterad well onto the genal surfaces, latter only slightly convex without flattened margins, a little sinuate. Labrum with about 28 stout setae, the series merging into the 3 large genal marginal setae on each side.

Antennae moderately long (5.0 mm) and slender, reaching back to 3rd segment; all of the articles moderately setose but vestiture increasing distally; article 7 cylindrical, apically rounded, the free margin inturned between and separating the 4 sensory cones, outer (dorsal) side of article with a small rounded sensory area. Relative lengths of antennal articles, in decreasing order: 2-3-4-5-6-1-7 (perhaps abnormal).

Collum broader than head, smooth, convex, anterior margin an even arc, almost a semi-circle; median fourth of caudal margin rather deeply concave. Anteriolateral edge of set off by a fine groove extending dorsad as far as base of mandibles. Lateral corners almost rectangular. A row of six widely spaced submarginal microsetae along the rear edge of the segment.

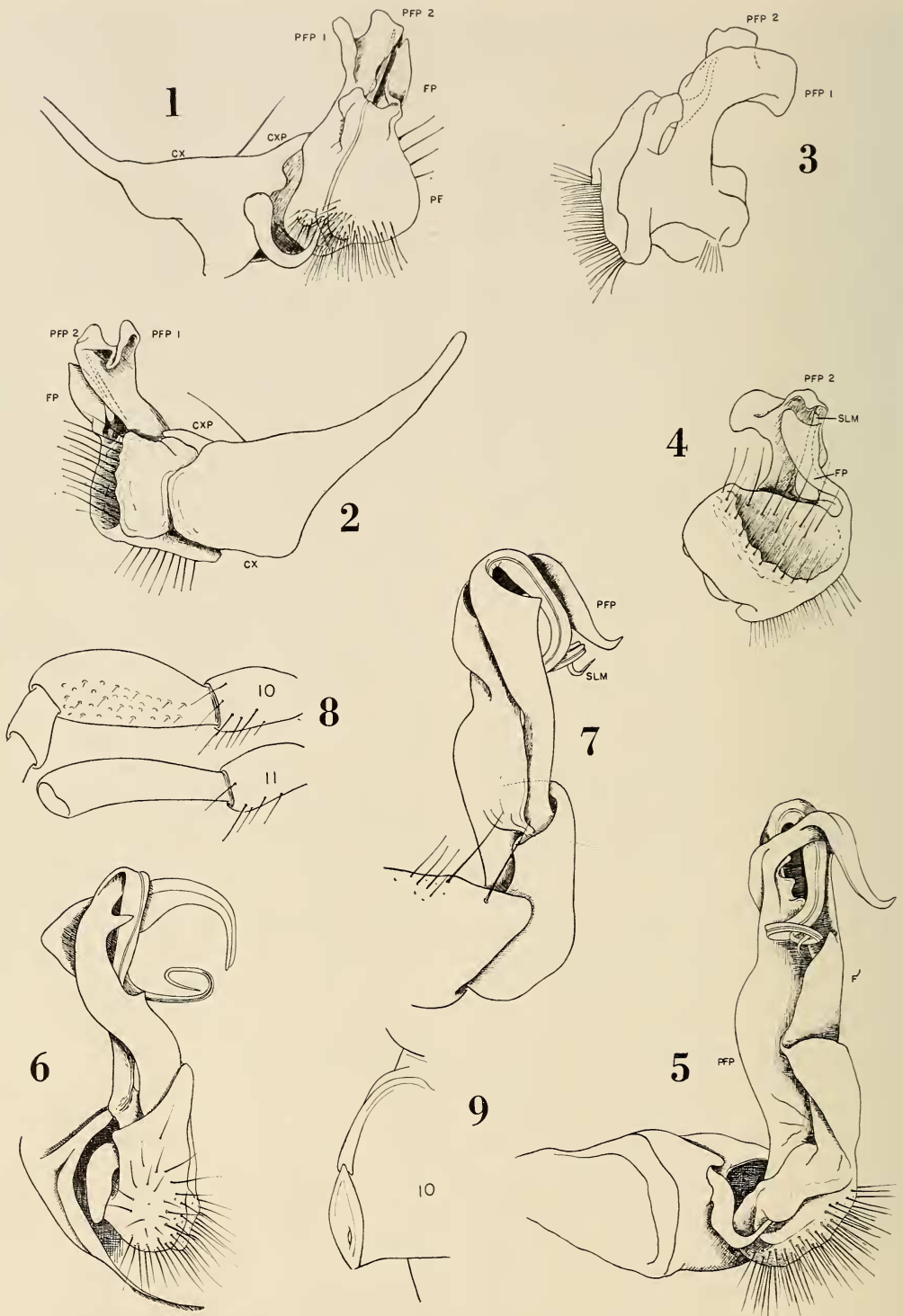
Second segment slightly broader than the others, the paranota broad and only slightly depressed, not tilted cephaloventrad; the paranota margined only on anterior edges, lateral and caudal edges continuous with dorsal surface. Segments 2-4 with small but distinct scapular dentations, these segments all essentially similar in size and shape. In going caudad from 5th segment the paranota become increasingly reduced, the anterior corners become more oblique and the posterior more acutely produced. On all poriferous segments the peritremata are elongate and slender, the pores opening dorsolaterally almost at their posterior ends.

Prozonites and metazonites of equal size, separated by a broad, smooth, interzonal furrow in the convexity of a distinct intrasegmental constriction. Surface of segment smooth and polished, without granulations or perceptible setal sockets.

Paranota of 19th segment rudimentary lobes just large enough to carry the pores, scarcely extending beyond caudal margin of the segment. Anal segment small, the epiproct short, bluntly conical, bent slightly ventrad. Anal valves smooth, with a median setiferous convexity, the mesial edges produced as raised rims, the marginal setiferous tubercles small, set quite high on the valves, and separated from the marginal rims. Hypoproct large, subcircular, the median projection broad and low but distinct between the small paramedian tubercles.

Pleural areas entirely smooth, unadorned; stigmata small and opening almost flush with the surface just above and in front of the coxae. Sterna broad, glabrous, unmodified, the legs inserted into an abruptly elevated podosternum, this not produced into subcoxal spines or knobs, but distinctly notched between the coxae on each side and with the caudal side deeply concave between the last legpair of each segment.

Legs long and slender, the joints virtually glabrous except for a ventral macroseta on each coxa and prefemur, and some microsetae on the following three joints. Tarsus sparsely invested with fine slender setae, these distinctly procum-



FIGS. 1-9.—1, *Antrogonodesmus curiosus*, n. sp., mesial aspect of left gonopod of male holotype; 2, lateral aspect of same; 3, telopodite of right gonopod seen from the coxal side; 4, telopodite of left gonopod in ventral aspect; 5, *Amphelictogon dolius* Chamberlin, mesial aspect of left gonopod; 6, ventral aspect of right gonopod; 7, lateral aspect of right gonopod; 8, ventral aspect of basal two joints of tenth and eleventh leg pairs; 9, left parantom of tenth segment. (Abbreviations: CX, coxa; CXP, coxal process; F, femur; FP, femoral process; PF, prefemur; PFP, prefemoral process; SLM, solenomerite.)

bent. Pretarsus small, short, slightly curved. Leg joints in decreasing order of length: 3-6-5-2-4-1.

Tibiae of legs 1-10 with extruded arthrodial subtarsal pads, apparently a few others behind the 10th can be extruded also. Seminal processes of second coxae rudimentary, they open through a low conical swelling of the coxae. Sterna of anterior segments broad and without any trace of subcoxal knobs or processes. Anterior pretarsi also small and similar to the others.

Pleurae of segments 2-7 modified by a distinct groove from the caudal margin of the segments, curving cephaloventrad to form an arc just above the coxae, thence fading out toward the interzonal furrow. The low ridge formed by this groove is entirely smooth.

Gonopod aperture quite small, broadly transversely oval, about three times as wide as long, its edges produced distally into a complete circumgonopodal rim of moderate height. Aperture entirely confined to the metazonite of the seventh segment, not infringing even onto the course of the interzonal furrow.

Telopodites of gonopods, seen in situ, very small, not extending beyond prozonite of segment although the coxae of normal size for the bulk of the animal. Coxae attached by a very small, elongate sternal remnant, and with long slender apodemes, produced on the cephalic surface into an elongate subconical coxal process (CXP). Prefemora greatly enlarged especially on the ventral surface, which is largely occupied by a deep subcircular cavity, lined with long setae (Figs. 2 and 3), unlike anything now known in other chelodesmids. In mesial aspect, prefemora are short and broad, with a straight seminal groove proceeding distad to the base of the solenomerite. A large prefemoral process (PFP), distally expanded and divided into two subequal laminate lobes, the outer of which is terminally reflexed and curved to form a hood-like structure covering the solenomerite (PFP 2) as seen in ventral aspect, Fig. 3. Two other gonopod processes, probably postfemoral in structure, are the solenomerite (SLM), a simple, slightly curved, mostly concealed blade carrying the seminal groove, and the femoral process (FP), which originates near the base of the solenomerite, and shields it on the ventral side.

Female paratype: similar to the male in most structural details, but the body somewhat larger with wider sterna and narrower paranota, and with the interzonal furrow more deeply impressed. The antennae are longer (5.8 mm), with

articles 2-6 almost identical in size and shape. The color pattern is identical except that the 3rd segment lacks the median spot. The body form is less attenuated caudally. Length, 35.0 mm, widths of selected segments:

2d	5.0mm
10th	4.9
16th	4.9
18th	3.8

Remarks.—Heretofore two chelodesmoid genera have been known from Cuba: *Amphelictogon* and *Cubodesmus*, both abundantly represented by species from the eastern half of the island. *Antrogonodesmus* is perhaps endemic to the western part of the island, geographically vicariating for the other two, but apparently not closely related to either of them. There is, in fact, no known genus with which it can be compared. The large prefemoral cavity is unique, and the relationship of the terminal processes almost so.

As regards body forms and details, *Antrogonodesmus* seems to have no close ties with Central American forms such as the dominant chelodesmid genus *Chondrodesmus*. Tibial pads on the male legs occur in numerous genera of South America, but the systematic significance of these structures has yet to be proven at least as regards tracing affinities of genera so provided.

With most of the collecting which has been done in Cuba restricted to the mountains of Oriente, it would be premature to speculate on the likelihood of a distinctive endemic fauna in the hills of Pinar del Río, yet such is suggested by the discovery of an unusual chelodesmid. Perhaps the intervening lowlands of Cuba have been largely submerged through the Tertiary to enhance the development of two distinct faunas. Further exploration west of Havana is certainly much to be desired.

Genus *Amphelictogon* Chamberlin

Amphelictogon Chamberlin, 1918, Bull. Mus. Comp. Zool. **62**: 224.—Loomis, 1938, Bull. Mus. Comp. Zool. **82**: 460.—Attems, 1938, Das Tierreich **68**: 157; 1940, *ibid.* **70**: 552.—Loomis, 1941, Psyche **48**: 35.

Type species.—*Amphelictogon cubanus* Chamberlin, by orthotypy.

Diagnosis.—*Amphelictogon* is characterized primarily by the structure of the gonopods, which are rather small and project from a strongly modified sternal aperture. The coxae

are connected by a small but distinct, attenuate sternite, and are produced into a triangular projection partly concealing the lateral face of the prefemur. The telopodite projects directly distad from the prefemur as a rather straight stalk which, however, is bent abruptly retroproximad, strongly attenuated, and drawn out into a long coiled flagellum. Prefemoral process set off by a distinct articulation, extending distad as far as the geniculum of the telopodite, where it normally curves proximad as a slender falcate blade, occasionally with a terminal expansion or a subterminal accessory process.

Body form slender, collum and second segment widest, segments posterior to 4th becoming gradually narrower to end of body. Paranota widely separated by the large exposed prozonites, the two subsegments separated by a well defined interzonal furrow. Prozonite of 7th segment of males complete, not reduced in front of the gonopod aperture. Legs long and slender, without tibial pads, the pretarsi short and slender, unmodified. Pore formula normal, peritremata usually specialized and set off from margin of paranota.

Coloration variable, the dorsum dark brown with spots or bands or red, yellow, or white.

Species.—22, most of them from Oriente Province, Cuba, one from the Bahamas and one from Isle of Pines.

***Amphelictogon dolius* Chamberlin**

Figs. 5-9

Type specimens.—Female holotype and paratypes, M. C. Z. nos. 5024-25, from Punta de Judas, 40 miles east of Caibarién, Santa Clara Province, Cuba, collected by Thomas Barbour in 1917-18.

Diagnosis.—The color pattern alone sets this species off from the other known species of *Amphelictogon*. On the basis of the gonopods, *dolius* is allied to *bidens* Loomis and *strumosus* Loomis in having the prefemoral process distally arcuate and slender and the telopodite femur with two marginal teeth. It differs from both in details of gonopod structure as well as color pattern.

Description.—Male: body elongate, slender, widest across collum and attenuate caudally; outline of body strongly moniliform, the prozonites large and broadly separating the metazonites. Paranota set high on sides and nearly horizontal. Length of specimen approximately 30 mm., widths of selected segments as follows:

Collum	4.5mm
5th	4.2
10th	4.0
17th	3.5

Segments rich chestnut-brown, head and antennae lighter brown; legs brownish pink, becoming reddish distally. Dorsum of paranota and adjacent part of the metatergites as well as tip of epiproct chalky white, each white spot wider than the brown of the intervening mid-dorsal area.

Head capsule normal in appearance, convex, smooth; median groove of the vertex well defined. Clypeal region set with numerous long fine setae, the upper edge of the area limited by a transverse row of larger setae, above which only a few scattered setae occur on the lower frons. A pair of subantennal setae, and two pairs on the vertex is a transverse row, the setae of each pair set close together. Labrum fringed with about 40 long setae, intercalated with much shorter ones. Genae rather flat, evenly convex.

Antennae long (5.8 mm) and unmodified, articles 2-6 similar in size and shape, 1 very short, 7 subhemispherical, its distal edge turned in mesially between each of the 4 sensory cones and almost completely separating them; dorsal (outer) side of article 7 with a small rounded convex sensory area.

Collum broadly transverse, wider than head, surface evenly arched and smooth. Anterior margin evenly rounded through almost a half circle, posterior margin strongly bisinuate, i.e., with a median and two paramedian emarginations, the latter emphasizing the lateral corners of collum. Both edges set off by a submarginal groove, deepest at the lateral ends and obsolete across middorsum.

Second, third, and fourth tergites subsimilar in appearance but narrowing in width, paranota broadly transverse; anteriorly the margins are evenly rounded and set off by a distinct ridge, posteriorly the margins are bisinuate and set off with a fine ridge; caudolateral corners distinctly produced. Surface of metatergites smooth and polished, of prozonites finely shagreened, the two subsegments separated by a deep sharply defined interzonal furrow.

Segments 5 through 19 narrower than the preceding, the anterior paranotal corners increasingly reduced along with width of the paranota, the prozonites proportionately more conspicuous along middle of body. Lateral margins of segments 17-19 scarcely divergent from median body axis, paranotal angles directed caudad,

abruptly smaller on segment 19. Poriferous segments (5, 7, 9, 10, 12, 13, 16-19) similar to others except for the strongly differentiated peritremata, these elongate pyriform, the upper surface flattened, pore directed dorsolaterad (Fig. 9). Caudal edges of paranota margined, but none produced into marginal dentations.

Epiproct subconical in dorsal aspect with a small cylindrical truncate apex beyond the terminal whorl of macrosetae; lateral tubercules of both whorls large and interrupting the curve of the sides. Disc of anal valves convex, smooth, surface of basal third of valves vertically striate, mesal edges very strongly compressed, each valve with an oblique secondary ridge projecting from about the basal sixth and extending cephaloventrad to near the lateral ends of the hypoproct. Latter about twice as wide as long, with the ends acutely rounded and the distal edges nearly straight, and with a large and distinct median terminal lobe. Setiferous tubercules small and removed from the edges.

Pleural and ventral surfaces smooth and nearly glabrous, the former without pleural carinae or other modifications. Interzonal furrow continues well-defined around the segments in a strong constriction between prozonites and metazonites.

Legs inserted upon a distinctly elevated podosternum, which is not produced into subcoxal processes, and glabrous except for a row of 10-14 setae across the anterior surface above the interzonal furrow and a few scattered setae in general located near the coxal sockets. Legs long (up to 5.2 mm) and slender, the joints in decreasing order of length: 3-6-5-4-2-1. Basal two joints glabrous except for a few long ventral macrosetae, distally the joints are increasingly setose. Most legs are similar in proportion except the 9th and tenth pairs, the femora of which are conspicuously enlarged with the ventral surface flat or subconcave, ornamented with numerous flat tubercules each of which bears a tiny curved seta (Fig. 8).

Anterior legs smaller than the others but similar in form, without tibial pads or other modifications. Seminal ducts open flush with the surface of the 2d coxae. Sterna between the 3d legs (4th segment) produced into two contiguous elongate mounds; sterna between fourth legs produced into 2 low subconical knobs; the other sterna unmodified. Pretarsi short, slightly curved, somewhat compressed.

Prozonite of seventh segment not infringed

upon by the small aperture of the gonopods and generally similar to adjoining segments. The aperture with the edges produced distad forming a circumgonopodal sheath, the rim of which is flared and recurved toward the body. Gonopods large, extending cephalad onto the 6th segment, not in contact mesially or but slightly so; the coxae joined by a small elongate sternal remnant, without a coxal process, but extending somewhat behind the prefemora on the lateral side.

Prefemora rather small, densely setose. Prefemoral process elongate, as large as main part of telopodite, terminating distally in a slender, simple, attenuated curved process, the inner edge of the process provided just beyond the midlength with three rounded projecting lobes. Femora short, flat, glabrous, separated from the more distal part of the telopodite by a deep (flexible?) groove or cingulum. Postfemur elongate, slender, the basal half with two acute projections along the mesial edge; just beyond the distalmost projection the telopodite is abruptly reflexed proximad and drawn out into a long coiled flagellum (Figs. 5-7).

Female: similar in structure to the male but somewhat larger, the tergites wider (4.6 mm at tenth segment, 5.0 mm at second). Color pattern similar to that of male except that the collum is completely ringed with white.

Remarks.—This species has heretofore been known only from the type locality. The material described originated at the Cueva de Colon, in Matanzas Province, Cuba, extending the known range about 130 miles to the west.

Amphelictogon dolius appears to be remarkable for the enlargement of the femora of legs 9 and 10. Whether such modification is unique in this species or merely overlooked in others I cannot guess. In the form of the gonopods *dolius* is very much like Loomis's species *bidens* and *strumosus*, but differs so much in color pattern from both that subspecific status seems unlikely. Probably actual comparison of specimens of the three will provide various points of difference not apparent from the published descriptions.

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